

Response to Comments on the Fecal Coliform TMDL for Four Mile Run	
Comment	Response
<i>Comments from the Metropolitan Washington Council of Governments (MWCOG)</i>	
Section 1: Introduction	
Because revisions to the designated use of FMR might be likely, it might be worthwhile to reference designated uses and the Use Attainability Analysis (UAA) in Section 1.1 when describing the other elements of the TMDL process.	Designated uses are described in Chapter 1, and UAAs are discussed at length in Chapters 1 and 6. Some of this discussion has been expanded in the final report. Section 1.1 is reserved for general background and a physical and geographic description of the study area.
In Section 1.1.1, a sentence reads: "NVRC's recently completed MST study of bacteria sources in Four Mile Run also illustrated the importance of waterfowl....". The term "importance" in this context is not clear. Perhaps "influence" is more appropriate.	Agreed. This sentence has been rewritten for greater clarity.
Section 1.2 contains the sentence: "A direct correlation can be made between high levels of fecal coliform and high levels of pathogenic organisms." This is not quite true as the statistical evidence between fecal Coliform and the human health risk from pathogens is weak. In fact, it is because of this weakness that many regulatory agencies, including the VADEQ are examining alternative indicator organisms like E-coli. At best, one can say that a direct relationship can be inferred between high Coliform counts and high pathogen counts. Note that even with a switch to e-coli as an indicator species, the statistical correlations between these bacteria and pathogens are still not very strong.	This sentence has been removed from the final report. The points raised in this comment have been debated for many years, and debate is expected to continue for many more. To date, no perfect indicator of human health risk has been developed, and fecal coliform was the first indicator pushed by the federal government after passage of the Clean Water Act. While fecal coliform has been traditionally used as an indicator of human health risk—and is still used by a majority of the states—EPA now recommends that states switch to other indicators, as Virginia is in the process of doing. NVRC concurs with MWCOG that statistical correlations between any proposed indicator bacteria and pathogens are still not very strong. Nevertheless, compliance with the Clean Water Act requires that some indicator be used.

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Based on the results of the TMDL modeling presented in later sections of the report, Section 1.3.2 "Water Quality Standards Review" seems to be the most relevant section of this report. From the description in the report and from first-hand knowledge of the creek, it's seems apparent that full-immersion swimming is not a likely use of this waterbody. And while there is access to this creek by children and the human health risk must remain paramount, the existing designated use as a primary contact stream needs to be examined based on a reasonable probability of contamination. If that probability can be reasonably defined, then other issues (e.g. socio-economic impacts, wildlife sources, etc.) can be better addressed.	If reductions in controllable, anthropogenic sources are not sufficient to restore water quality in Four Mile Run, "the Commonwealth may decide to re-designate the stream's use for secondary contact recreation or to adopt site specific criteria based on natural background levels of fecal coliform bacteria. The Commonwealth must demonstrate that the source of fecal contamination is natural and uncontrollable by effluent limitations and BMPs through a Use Attainability Analysis (UAA). All site-specific criteria or designated use changes must be adopted as amendments to the WQS regulations. Watershed stakeholders and EPA will be able to provide comment during this process." The text in quotation marks has been added to Section 6.4 of the report.
Section 2: Watershed Characterization	
(a) Section 2.2 begins with the sentence "Land use is a predominant determining factor for source of fecal Coliform deposition" but the rest of the section does not explain or support this statement. (b) Later in that paragraph, Figure 2-5 is referenced for land use locations. This should be Figure 2-3.	(a) Explanatory text has been added to this section. (b) This reference has been corrected.
(a) Table 2-2 should note the units shown and the Segment numbers are not defined in the report at this point. (b) Segments, which are addressed in Section 4 should be described before this table. (c) Is there no Table 2-1?	(a) Units were noted in the table title. (b) Text has been added to refer readers of this section to Chapter 4, which describes the model segments. (c) The numbering of this table has been corrected.
Figures 2-1, 2-2, 2-4, 2-5, and 2-6 are not referenced anywhere in the Section (assuming Figures 2-3 is correctly referenced. An effort should be made to describe these figures in the text. In particular, Figure 2-1, 2-5, and 2-6, which contain important information should have a better description in the text.	Numbering for all figures (and tables) provided in the final report has been corrected where corrections have been needed. All figures are now described in the text of the report. Where it was deemed necessary, and in response to comments, cursory descriptions of various figures have been expanded.
Figures 2-10 and 2-11 are not referenced in the text. In fact, they seem to have the same titles as Figures 2-7 and 2-8, respectively, but the values in the charts are different.	These figures have been removed from the final report because they are unnecessary and confusing.

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It is apparent from the data provided in Figures 2-5 and 2-6, that the data being collected has an upper detection limit of about 8,000 MPN/100ml and a lower detection limit of 100 MPN/100ml (with the exception of a lone point in February 2001). This is not an insignificant issue when describing bacteria data, and in particular when deriving statistical summaries of the data. A better description of the sampling program needs to be provided, including identifying these detection limits. A nontrivial number of samples are reported at the lower detection limit.	Text has been added to the final report to better describe all the water quality datasets used in this report, with special attention given to describing their respective detection limits. Additionally, Appendix D has been added to show exact bacteria counts, dates, times, sources, and critical remarks for all data used for calibration of the TMDL model.
Section 2.3.1 describes the seasonal analysis of the data using arithmetic means. In general, this statistic should be avoided for bacteria analysis in general because the high outliers can skew the data. It is for this reason the VADEQ uses a geometric mean for the water quality standard. Specifically this statistic is very inappropriate given the previous bullet about the detection limits. Any attempt to derive a mean from a data set with a significant number of values outside the detection range is going to produce questionable results. We would recommend this same analysis using medians and other percentiles (90 th percentile would be appropriate because of the definition of attainment).	The question of how to handle data at the detection limits, specifically with regard to performing seasonal analyses, was debated during the course of developing the draft TMDL. Arithmetic means have been commonly used in previous Virginia TMDLs, and were presented in this TMDL report for consistency with other Virginia TMDLs. Seasonal analyses using alternative statistics were computed in response to this comment, but were not presented in the final report for two reasons: (1) the results did not change the conclusion of the previous analysis; and (2) presenting arithmetic means adds consistency with previously published TMDLs.
The delineation of the seasons used in the analysis should be defined. (were these based on calendar months or actual seasons?)	The following sentence has been added to the final report: "The seasonal cutoffs used in this analysis were the actual calendar dates for each season, and were not rounded by month. Thus, data collected on different days of a month that straddled two seasons were split between these seasons."
Section 3: Source Assessment	
There are two references to Table 6 in the text. This should be changed to Table 3-1.	This change has been implemented.
Figure 3-1 is not referenced in the text.	This figure is now referenced in the text.
The decision to use local naturalists to assess the results of the genetic typing survey seems to be a very appropriate element to this analysis.	Every effort has been made to develop the most effective TMDL possible with the information currently available.

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Section 4: Modeling Approach for Four Mile Run TMDL	
The figures that were not referenced in Section 2 should be referenced and placed in Section 4.	This suggestion has been implemented in the final report. Each figure has been moved to Chapter 4 and new descriptions of these figures have been added.
Figures 4-5 and 4-6 are not referenced in the text.	These references have been added to the final report and new descriptions of these figures have been added.
In Section 4.8.2, the sentence that begins “The main objective of the calibration runs...” is repeated consecutively between paragraphs.	This has been corrected in the final report.
One way to manage the problem of the start-up period required by HSPF is not to divide one’s dataset, but rather to run the same data through the model twice in series. The first time running the dataset will allow the model to reach the necessary equilibrium levels, while the second time running the same data set will provide the results of the model. This method has been adopted successfully in other uses of the HSPF model.	This is an excellent suggestion that NVRC wishes it knew about earlier in the development of this TMDL. NVRC and DEQ will keep this in mind when developing future TMDL models.
Why was data on chickens used to represent other wildlife sources? It seems unlikely that the loading rates from chickens, which are raised on farms with regimented and scheduled diets, would be consistent with other wildlife. And presumably the other wildlife category contains primarily smaller animals such as squirrels, chipmunks, songbirds, reptiles, etc. Few of these creatures would have the same size as a standard farm chicken. Nonetheless, if other data do not exist, and the chicken rate is based on the best professional judgment, then this number is acceptable.	Data on chickens were used to represent other wildlife sources because more is known about the bacteria production of chickens than of most other animals. A footnote in Table 4-4 (in both the draft and final reports) states that wildlife densities were estimated in terms of “equivalent chickens.”
What is the estimated value of the “non-picked-up” dog scat percentage described in Table 4-4? How was this number determined?	The estimate of 40% “non-picked-up dog scat” came from the best professional judgment of NVRC’s TMDL project manager, and is a refinement of his 1994 white paper, <i>Dog Waste Contributions to Urban NPS Pollution</i> , which was cited in the draft and final report.

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Section 5: Load Allocations	
It is not clear why waterfowl and raccoons are considered anthropogenic wildlife species while others are not. What is the distinction between these animals, and other animals that are also affected by the influence of human intrusion on habitat?	<p>The term “anthropogenic” comes with both merits and ambiguities. While populations of different animal species respond in different ways to high densities of modern human settlement, clearly, populations of resident Canada Geese and pets owe their very presence to humans. As referenced in the report, the extremely elevated population densities of raccoons in urban areas are also a by-product of modern human settlement. With the exception of squirrels, rats, and a few other species that did not account for a significant slice of the BST pie, other species do not derive as clear a population density benefit from an urban environment. For example, deer and beaver adapt better than other wildlife species to certain humanized landscapes, but in the ultra-urban Four Mile Run watershed, these species probably exist in population densities at or below pre-colonial levels. Such an explanation was deemed divergent from the intent of the report, which was to distinguish between controllable populations of so-called “nuisance wildlife” (a term also deliberately left out of the report) and less controllable background populations of other wildlife.</p>

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It is not particularly clear the distinction between the sources of wasteload allocations and load allocations, since a predominant percentage of drainage to the FMR comes through the existing municipal storm sewer system (MS4).	<p>The question of applying WLAs to MS4s is a real issue. A new section (3.2) has been added to the final report to help address the issue. It says, in part: "In the Four Mile Run watershed, the MS4s intercept groundwater flow during baseflow periods, and are dominated by runoff during and immediately after rainfall. This baseflow is controlled by pervious surface processes such as infiltration, while the storm flow is dominated by runoff from impervious surfaces.</p> <p>In response to a comment by EPA Region 3 staff requesting more detail about WLAs for each MS4, the following was offered: "The final report adds language to better explain how waste load allocations (WLAs) were determined for MS4s. WLAs were developed for MS4s at the behest of Virginia DEQ and EPA. The issue of using TMDLs to develop WLAs to regulate MS4s was mentioned repeatedly by local governments as a point of strong concern and should be revisited. There is no real science to add validity to using WLAs in this way. Table 5-2 was added to present average annual loadings for the TMDL scenario for both pervious and impervious portions of each land use. While the total TMDL allocation is accurate and the per-land use loads are defensible, there is no real science to justify an exact split of these loads between impervious and pervious portions of each land use."</p>

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<p>When addressing stormwater-induced loads to a waterbody, a TMDL should be based on the average conditions, while still considering seasonality and critical conditions. Often, this means that models are run over a “typical” range of hydrologic conditions. The best method to do this type of analysis is to look at a long-term period of record and average the results. Evaluating a TMDL on a short time period can considerably affect the results of the allocation, particularly if this period of record is during a drought or rainy hydrologic cycle. The FMR run allocation is based only on the 17-month calibration period. While the report indicates that this period contains high flow and low flow conditions, it cannot be assessed whether this 17-month period of record is representative of average conditions.</p> <p>We recommend two options to resolving this issue. The first option is to conduct a statistical analysis of the hydrologic data used for this calibration period and compare the results it to the statistical information from the long-term period of record at National Airport. This analysis would allow an assessment on whether the allocation period is representative of average conditions. The second option would be to run the calibrated model using a longer-term period of record from the historical data set. In TMDL programs that are being developed regionally in Maryland and the District of Columbia, a three-year period of record representing a wet year, dry year, and average year are run consecutively. The TMDLs are based on an average of this three-years scenario. Coincidentally, the three consecutive years of 1988-1990 represent an average year, a wet year, and a dry year.</p>	<p>The Four Mile Run TMDL model used 29 months (not 17 months) of combined calibration and verification period, and also for developing the TMDL load allocation. That is, calibration parameters were optimized to provide the best results over the only 29 months for which calibration data was available. Then, separate statistics were generated for each calendar year and season to check against bias for any particular subset of calibration data. Fortunately, the 29 month period includes a wide variety of conditions from very wet months to drought conditions.</p> <p>NVRC staff agrees that if the period of data available to develop this TMDL were greater than it was, a more complete assessment of historic precipitation records could have been performed, and—more importantly—the TMDL model could have been run over a different period. One caution is that population and land use are dynamic over time, and the suggested period of 1988 – 1990 is near the limit of an accurate verification period.</p>
Section 6: Reasonable Assurance for Implementation:	
<p>The sentence in Section 6.4 that begins “This goal has been presented to the stakeholders...” is unclear.</p>	<p>This sentence has been removed and the entire section has been rewritten and expanded for greater clarity.</p>

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<p>Section 6.1 describes the follow-up monitoring for FMR. Is this monitoring effort going to increase beyond the current quarterly monitoring? If not, it seems very unlikely that this quarterly monitoring program will provide sufficient data to assess the stated goal “to evaluate reductions in fecal bacteria counts and the effectiveness of the TMDL in attaining and maintaining WQ standards.”</p>	<p>Follow-up monitoring will initially be monthly or bimonthly based on DEQ's ambient monitoring program. This should be sufficient until the Phase 1 implementation goal is met, after which the monitoring frequency may need to be adjusted.</p>
<p>The TMDL document describes how the TMDL will be implemented in a two-phased approach. The first phase would be to implement an interim target to reduce the “controllable” sources of bacteria (human and canine). The second phase would focus on ways to reduce wildlife contributions and would be implemented if it were determined that the first phase of the TMDL did not achieve water quality standards. The second phase would consider re-designating the stream or adopting site-specific criteria based on background levels if the contamination is natural and uncontrollable by effluent limitations and BMPs.</p> <p>Based on the results of the genetic-typing and the modeling presented in this report, we already have our answer regarding the attainability of existing water quality standards. Even if we assume that we can attain reductions of “controllable” sources at the 98% level (there are no known technologies that can achieve these reductions), the wildlife sources will not allow standards to be met. Therefore, it seems that moving ahead with site-specific criteria or re-designating the stream through a Use Attainability Analysis should be the next and immediate step in the process. Developing interim goals for the “controllable” sources should still be an element of this TMDL, however these goals should be developed with the understanding that existing water quality standards cannot be attained.</p>	<p>While the genetic-typing and modeling tools used to develop this TMDL are the best available, they still have potentially substantial sources of error. In addition, significantly higher reductions than were anticipated have been achieved in controllable sources in several rural watersheds that are already in the implementation phase. One of the conditions of moving ahead with a UAA is that other practicable options have been tried and failed. The Commonwealth contends, therefore, that the most prudent course of action is to proceed with reductions in controllable sources and assess their impact on water quality before considering a UAA.</p>

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It is not clear how existing and future MS4 permits will be affected by this TMDL plan. The text of the document indicates that loads from MS4 outfalls represent approximately 2% of the total load, but that number does not seem consistent with the percentage of the land area draining to MS4 outfalls (this comment is a carry-over from a previous comment in Section 4).	New text was added to the final report that describes how WLAs were determined. As explained in the report, since there are no point sources of bacteria in the watershed, these WLAs were used as proxies for MS4 loads. The Commonwealth realizes that the WLA is a gross estimate of the loading transported by the MS4. While the Commonwealth is required by EPA to express loadings from permitted facilities as WLAs, it is expected that the TMDL would be represented in the MS4 permit not as a numeric limit but as a requirement for pollutant-specific best management practices. Therefore, the permit requirement for this TMDL would be the implementation of fecal coliform specific BMPs.
It is not clear what the enforcement mechanism is for developing this implementation plan. During the public meeting, the term “volunteer” effort was used to discuss the requirements of the local jurisdictions, though this term is not specifically addressed in the report. Given the complexity of these issues, the future change to another indicator species, the potential for re-designating the stream, and the uncertainties associated with wildlife sources, a volunteer program seems to be the most appropriate requirement for this TMDL. The actual requirements that will result from this TMDL should be better defined for the affected jurisdictions.	The development of an implementation plan (IP) is required under Virginia’s 1997 Water Quality Monitoring, Information, and Restoration Act (WQMIRA) and is a separate process that will take place after approval of the TMDL by EPA. Options for implementation can be presented in the TMDL, but the actual requirements will be determined through the IP development process and defined in the final IP. The IP will be developed in conjunction with local governments and stakeholders. The Commonwealth is optimistic that water quality problems can be resolved through voluntary actions.
The timeline for this phased implementation is not well defined. We don’t know when the second phase of the TMDL will be implemented, only that it will happen when the assessment of the Phase I controls proves insufficient. Since we already know from these studies that Phase I cannot achieve water quality standards, would it be reasonable to immediately begin the process to implement Phase II (i.e. begin the UAA process)?	The precise timeline for implementation will be determined when the IP is developed. WQMIRA requires that the IP specify the date of expected achievement of water quality objectives. Eleven IPs have been developed in Virginia to date, and implementation of these plans began in the fall of 2001. As a general guideline, load reduction strategies (BMPs) should be in place within 5 years of IP development and the WQS should be attained within 10 years. As stated in response to an earlier comment, the Commonwealth contends that the most prudent course of action is to proceed with reductions in controllable sources and assess their impact on water quality before considering a UAA.

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Actions to address hot spots, such as the Doctor's Run condition, should be made a priority in the development of the implementation plan.	The suggestion is noted and will be raised during IP development. The Commonwealth would encourage MWCOG to participate in IP development for Four Mile Run.
Section 7: Public Participation	
The effective comment period was only two weeks, which was insufficient time for us to gauge regional reaction to the proposed TMDL or for us to develop any more than these initial COG staff comments. A public meeting prior to the publishing date, rather than two weeks after, would have provided a more reasonable comment period for all stakeholders.	The comment period was extended to April 22. The consent decree deadline of TMDL submittal to EPA by May 1, 2002 makes it impossible to provide any additional time for public comment. Every effort has been made and will be made in the future to provide as much time for public comment as possible.
Due caution is appropriate when considering re-designating any stream from primary to secondary contact and certainly the public comments resistant to any "weakening" of standards are important. However, given the results of this study indicating meeting existing standards is impossible, and the fact that the non-tidal portion of FMR is not a stream where full immersion swimming is a potential use, it seems inevitable that changing the use and the criteria will be the only recourse. The regulatory framework as defined by the Clean Water Act allows this option and it needs to be considered seriously in this case.	As stated in response to an earlier comment, the Commonwealth contends that the most prudent course of action is to proceed with reductions in controllable sources and assess their impact on water quality before considering a UAA. The following text has been added to Section 6.4: "In such a case, after demonstrating that the source of fecal contamination is natural and uncontrollable by effluent limitations and BMPs, the Commonwealth may decide to re-designate the stream's use for secondary contact recreation or to adopt site specific criteria based on natural background levels of fecal coliform bacteria. The Commonwealth must demonstrate that the source of fecal contamination is natural and uncontrollable by effluent limitations and BMPs through a Use Attainability Analysis (UAA). All site-specific criteria or designated use changes must be adopted as amendments to the WQS regulations. Watershed stakeholders and EPA will be able to provide comment during this process."
Appendix A was not provided in the copy of the report received at the March 25 meeting or in the PDF file on the web site.	25 copies of Appendix A were made available at the March 25 meeting. While it was available as a download on NVRC's website, it was not linked to the TMDL project webpage, as it should have been.

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<i>Comments from the City of Alexandria</i>	
City Staff's first comment is that there has not been a sufficiently long period for public comment. The draft TMDL paper was presented to the public at a public meeting held on March 25, 2002 and the comment period ends on April 9, 2002. This allows only a 15-day window for public comment. The City believes that the intention was to allow a full 30-day comment period for public comment but as the TMDL development paper was late in going public subsequent deadlines were not pushed back. The City of Alexandria requests that a additional 30-day comment period be allowed for this TMDL development draft	The comment period was extended to April 22. The consent decree deadline of TMDL submittal to EPA by May 1, 2002 makes it impossible to provide any additional time for public comment. Every effort has been made and will be made in the future to provide as much time for public comment as possible.
City Staff would further like to comment regarding the conflict of mandating the development of a TMDL for a Fecal Coliform standard while the concurrently working to replace this standard with enterococci and Escherichia coli bacteria criteria. The City does no deny that there are likely overlaps between a TMDL for Fecal Coliform and a TMDL for enterococci and Escherichia coli bacteria; however, the development process for any TMDL focus water quality efforts to meet a very specific standard, in this case Fecal Coliform. Much effort was expended to develop a TMDL for Fecal Coliform only to say now that a enterococci and Escherichia coli bacteria TMDL would "likely" be similar to this Fecal Coliform TMDL; its arbitrary to say that meeting new standard would require the same TMDL development or implementation. The City is very concerned about the tough implications outlined in the Four Mile Run TMDL and are very concerned that the real targets of a TMDL developed for enterococci and Escherichia coli bacteria could be different and thus not addressed by the TMDL.	EPA has been a proponent of changing the indicator species to E. coli/enterococci since 1986. Because E. coli are a subset of fecal coliform, both indicators share the same sources and any controls for fecal coliform are also expected to address E. coli. DEQ will conduct simultaneous monitoring for both standards for a period of time as the new standard is being implemented. The consent decree deadline of TMDL submittal to EPA by May 1, 2002 precludes waiting for the new standard to take effect and for sufficient E. coli data to be collected before developing and implementing the TMDL. The staged implementation approach proposed by the Commonwealth will allow DEQ to re-assess water quality in the stream to determine if the WQS is attained after Phase I implementation measures have been enacted. This opportunity for re-assessment will also evaluate the validity of modeling assumptions and allow the TMDL to be revisited at a later date should the proposed reductions prove ineffective.

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<p>Finally, the City is very concerned that the waste load reductions are not achievable. For example waste from wildlife and waterfowl is to be reduced by 95%. Geese are a protected species in Virginia, and the elimination of geese (as well as other wildlife) is impractical. It is highly unlikely that these reductions can be achieved through population control. Thus, the City will be faced with an unachievable TMDL. Of particular concern is the potential that noncompliance with the specified TMDL could be tied to the City's upcoming MS4-VPDES permit and result in fines for failure to improve an impaired water body.</p>	<p>While the genetic-typing and modeling tools used to develop this TMDL are the best available, they still have potentially substantial sources of error. Significantly higher reductions than were anticipated have been achieved in controllable sources in several rural watersheds that are now in the implementation phase. The same may be the case in this urban watershed. The staged implementation approach proposed by the Commonwealth will allow DEQ to re-assess water quality in the stream to determine if the WQS is attained after Phase I implementation measures have been enacted. Section 6.4 of the report has been changed (see EPA comment 5 above) to clarify the course of action proposed by the Commonwealth.</p> <p>In terms of the City's stormwater permit, DEQ realizes that the WLA is a gross estimate of the loading transported by the MS4. While the Commonwealth is required by EPA to express loadings from permitted facilities as WLAs, it is expected that the TMDL would be represented in the MS4 permit not as a numeric limit but as a requirement for pollutant-specific best management practices. Therefore, the permit requirement for this TMDL would be the implementation of fecal coliform specific BMPs rather than achievement of a specific percentage reduction.</p>

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<i>Comments from Arlington County</i>	
<p>The allocation scenario (Scenario 4) shown in Table 5-2 to achieve the existing fecal coliform standard for Four Mile Run requires a 95 to 98 percent reduction in bacteria loads from waterfowl, raccoons, and other wildlife, as well as from humans and dogs. As proposed, Scenario 4 is both unachievable with existing stormwater treatment and source reduction technologies and undesirable in terms of controlling urban wildlife populations.</p>	<p>While the genetic-typing and modeling tools used to develop this TMDL are the best available, they still have potentially substantial sources of error. Significantly higher reductions than were anticipated have been achieved in controllable sources in several rural watersheds that are now in the implementation phase. The same may be the case in this urban watershed. The staged implementation approach proposed by the Commonwealth will allow DEQ to re-assess water quality in the stream to determine if the WQS is attained after Phase I implementation measures have been enacted. Section 6.4 of the report has been changed (see EPA comment 5 above) to clarify the course of action proposed by the Commonwealth and now includes the following text regarding wildlife reductions:</p> <p>“Virginia and EPA are not proposing the elimination of wildlife to allow for the attainment of WQS. This is obviously an impractical action. While managing over-populations of wildlife remains as an option to local stakeholders, reducing wildlife or changing the natural background condition in a watershed is not the intended goal of a TMDL.”</p>
<p>The data presented in Table 5-2 indicate that even if controllable sources of fecal coliform bacteria are virtually eliminated, bacteria concentrations in Four Mile Run will not be reduced significantly. And, unless the bacteria model is significantly flawed, the phased implementation plan described in Section 6 of the report, with a first phase that focuses only on controllable sources of bacteria, will simply delay reaching what appears to be an obvious conclusion: the existing fecal coliform water quality standards for Four Mile Run will not be met by eliminating controllable sources of bacteria, and the existing bacteria standard may simply never be attained in Four Mile Run, given the need to reduce all bacteria sources by 95 to 98 percent.</p>	<p>One of the conditions of moving ahead with a UAA is that other practicable options have been tried and failed. The Commonwealth contends, therefore, that the most prudent course of action is to proceed with reductions in controllable sources and assess their impact on water quality before considering a UAA.</p>

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<p>Section 6.4 discusses options for addressing the 'uncontrollable' sources of bacteria in the Four Mile Run watershed, including waterfowl, raccoon, and other wildlife. This section explains that if the phase one reductions do not result in attainment of the water quality standards, "the second phase allocations would be initiated at a level necessary to meet existing standards." However, the 'second phase allocations' involve the 'uncontrollable' sources of bacteria in the Four Mile Run watershed—wildlife. Arlington County does not believe that the few viable measures that exist to control bacteria loads from wildlife (e.g., keeping waterfowl out of stormwater facilities) will have a significant effect, since there are only a few regional stormwater facilities in the watershed. Such measures are extremely unlikely to achieve even the 50 percent reduction from waterfowl called for under Scenario 2 in Table 5-2 and certainly will not result in the 95 percent reduction in loads from waterfowl under Scenario 4. Controlling bacteria loads from raccoons and other wildlife will be even more improbable, if not impossible.</p>	<p>Section 6.4 of the report has been changed (see EPA comment 5 above) to clarify the course of action proposed by the Commonwealth.</p>
<p>Therefore, consistent with Section 1.3.2., which states, "Virginia and EPA are not proposing the elimination of wildlife to allow for attainment of water quality standards," Arlington County does not believe the TMDL report should include any 'second phase allocations,' since, to achieve the necessary load reductions, this phase would most likely have to involve the actual elimination of wildlife—something that DEQ and EPA have explicitly stated is not a goal of either agency.</p>	<p>The development of an IP is a separate process that will take place after approval of the TMDL by EPA. Options for implementation can be presented in the TMDL, but the actual requirements will be determined through the IP development process and defined in the final IP.</p>

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<p>Finally, Arlington County has some concerns about the arbitrary assignment of all impervious surfaces to the 'wasteload allocation' (WLA) component of the TMDL equation. We understand that EPA considers the MS4 permit program to be a point source program, and the TMDL regulations require allocations for all point and nonpoint sources in a watershed. Nonetheless, stormwater runoff originates as nonpoint source pollution, and there is no scientific basis for the approach taken in the TMDL report. Overall, the WLA component of the TMDL represents only 2 percent of the total TMDL load, so this may not be a significant issue (although the very small proportion of the TMDL assigned to impervious surfaces underscores questions about the validity of this approach). However, Arlington County would like clarification from DEQ about the implications of the WLA in this TMDL for the County's MS4 permit.</p>	<p>DEQ realizes that the WLA is a gross estimate of the loading transported by the MS4. While the Commonwealth is required by EPA to express loadings from permitted facilities as WLAs, it is expected that the TMDL would be represented in the MS4 permit not as a numeric limit but as a requirement for pollutant-specific best management practices. Therefore, the permit requirement for this TMDL would be the implementation of fecal coliform specific BMPs rather than achievement of a specific percentage reduction.</p>

Response to Comments on the Fecal Coliform TMDL for Four Mile Run	
Comment	Response
<p>The TMDL report includes a detailed discussion of the calibration and verification of the hydrology model. The report should include a similar quantification of the error associated with predicting bacteria loads using the HSPF model, beyond the graphs shown in Figures 4-7 and 4-8 and the brief discussion in Section 4.8.2. Arlington County is aware that the bacteria modeling approach in this TMDL is consistent with that of other bacteria TMDLs in Virginia. However, the bacteria model is a central component of the TMDL and, given the error associated with the bacteria DNA study itself, the error of the bacteria model is probably significant and should be explicitly discussed in the report.</p>	<p>The following text has been added to Section 4.8.2 of the report:</p> <p>“The main objective of the calibration runs was to get the best fit possible between simulated fecal coliform values and the range of observed fecal coliform data. However, when calibrating integrated watershed models such as HSPF, the objective is not to match exactly each simulated and observed observation, but to make sure that the long term simulated water quality response captures the range of observed values which better describes and reproduces the response in the watershed.</p> <p>“As mentioned at the beginning of Section 4.8, one of the main reasons for wide discrepancies between simulated and observed bacteria values is that field measurements of bacteria are nearly always instantaneous grab samples, which can be highly variable across the course of each day, whereas simulated values are computed as daily averages. This is shown in Figures 4-9 and 4-10 where some of the observed-instantaneous fecal coliform values differ from their corresponding simulated values. Also, it is likely that had the observed data that was constrained by the upper and lower detection limits been allowed to reflect accurate readings, a somewhat better fit would be demonstrated. Overall, however, the model used for this TMDL captures the range of observed values sufficiently well.”</p>
<p>Arlington County does not believe the proposed fecal coliform TMDL for Four Mile Run has met all of the goals and objectives set forth in Section 1.4 of the TMDL report. Specifically, 'Objective 5' states that the TMDL must "determine the most feasible reduction plan that can realistically be implemented and incorporate it into the TMDL." The TMDL report as written does not appear to accomplish this goal.</p>	<p>Every effort has been made to develop the most effective TMDL possible with the information currently available. While the genetic-typing and modeling tools used to develop this TMDL are the best available, they still have potentially substantial sources of error. Significantly higher reductions than were anticipated have been achieved in controllable sources in several rural watersheds that are now in the implementation phase. The same may be the case in this urban watershed. The staged implementation approach proposed by the Commonwealth will allow DEQ to re-assess water quality in the stream to determine if the WQS is attained after Phase I implementation measures have been enacted.</p>

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<p>Arlington County believes the three components outlined for the second phase of the TMDL—adopting the new E. coli standard, changing the designated uses of certain streams from primary contact to secondary contact recreation, and adopting site-specific bacteria standards that account for background levels—should instead be the explicit focus of the first phase of the TMDL, concurrent with efforts to reduce controllable loads.</p> <p>As discussed above, Table 5-2 strongly suggests that the existing bacteria standard may simply never be attained in Four Mile Run. This information alone should be enough to start the Use Attainability Analysis process immediately, rather than delaying the UAA process several years as part of the second phase of the TMDL. Similarly, given the dominance of uncontrollable bacteria loads in the watershed, DEQ should not wait until the second phase of TMDL implementation to adopt site-specific bacteria standards that incorporate these loads. Finally, if the new E. coli standard is imminent, DEQ should not adopt a TMDL based on the existing fecal coliform standard.</p>	<p>The State Water Control Board (SWCB) is expected to adopt the new E. coli standard in May 2002. Consideration of the addition of a secondary contact designated use has been postponed until the next Triennial Review process in 2004. However, the reclassification of impaired waters for a secondary contact use has not been well-received at the TMDL public meetings where it has been suggested as an option. Neither of these options will be available in time for consideration in this TMDL. Finally, one of the conditions of moving ahead with a UAA is that other practicable options have been tried and failed. The Commonwealth contends, therefore, that the most prudent course of action is to proceed with reductions in controllable sources and assess their impact on water quality before considering a UAA.</p>